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THE PLANT DISEASE REPORTER

Issued By

Division of Mycology and Disease Survey

BUREAU OF PLANT INDUSTRY

UNITED STATES DEPARTMENT OF AGRICULTURE

Volume XXIV Number 6

April 1, 1940

The Plant Disease Reporter is issued as a service to plant pathologists throughout the United States. It contains reports, summaries, observations, and comments submitted voluntarily by qualified observers. These reports often are in the form of suggestions, queries, and opinions, frequently purely tentative, offered for consideration or discussion rather than as matters of established fact. In accepting and publishing this material the Division of Mycology and Disease Survey serves merely as an informational clearing house. It does not assume responsibility for the subject matter.

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DIVISION OF MYCOLOGY AND DISEASE SURVEY

Vol. XXIV Number 6

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AN OPEN LETTER TO COLLABORATORS

Thirteen States, among them several of the "Original Thirteen," have not yet submitted either their crop loss estimate sheets or their annual report cards for 1939. A number of other States have sent in either one or the other but not both. The crop loss estimates received have all been tabulated and supplemented from the annual reports and other sources. Annual report cards have been filed in suitable form for compiling the annual summary, and all the additional material could now be used to advantage. If it is at all possible to forward the missing reports soon it will be a great help. Will you do your part toward a hundred percent response?

Sincerely,

J. A. Edson

SIXTH EXPERIMENTAL FORECAST OF THE INCIDENCE OF BACTERIAL WILT ON SWEET CORN

Neil E. Stevens and C. M. Haenseler

Interest in bacterial wilt [*Phytomonas stewartii*] has shifted during the past few years almost entirely from sweet corn to field corn. The resistant Golden Cross Bantam so completely dominates the yellow sweet corn industry that susceptible yellow varieties are used only in northern New England where wilt has never been of commercial importance, in those regions where on the basis of the annual forecast it seems reasonably safe to plant, or within those areas around the large central markets where growers are willing to run some risk in the hope of getting a premium for early corn. On the other hand, the very rapid expansion of the planting of hybrid seed throughout the corn belt has resulted in the introduction of a number of strains which are apparently very susceptible to leaf infection by bacterial wilt, or what is regarded as bacterial wilt by most observers.

In view of this change of interest it was perhaps inevitable that some would assume that the forecasts made for the disease on sweet corn might apply equally well to the disease on field corn. While it is entirely possible that this will be true, it can not be too emphatically stated that the phase of the disease which has been most serious on field corn appears much later in the season and its abundance may be governed by factors quite different from those which apparently are associated with the seedling form of the disease which has been so serious on sweet corn. Moreover, while it is true that except for local irregu-

larities, the experimental forecasts have proved to agree closely with the subsequent development of the disease, it should be remembered that they have been made for only 5 years, entirely too short a period for much confidence to be placed in them.

SUMMARY OF CONDITIONS IN 1939

The continued popularity and commercial success of Golden Cross Bantam has so far reduced the interest in bacterial wilt of sweet corn that a personal solicitation usually is necessary to secure a report of its incidence. Some of the information in the following summary is derived, as is indicated, from personal letters and has not hitherto been published.

New York

The most northern county in New York from which we have any record of the disease is Ulster, where on June 20, Cyril G. Small reported a considerable amount of Stewart's disease on sweet corn (PDR 23: 208). In Orange County, the disease was reported on July 17 by W. H. Ewart to be very common where susceptible varieties were grown (PDR 23: 250). In Rockland County, W. J. Clark, who has followed the disease for several years, reported it as present in most fields but generally less than in the previous 2 years (PDR 23: 208). From Nassau County, Orson S. Cannon reported that the disease was present in susceptible corn varieties on June 19. He has supplemented this report by the following information contained in a personal letter. "The section near Bellmore [near the south shore of Long Island] has wilt every year. The amount of wilt in a small test plot of Gill Brothers' Golden Bantam is given in the following table:

Date of Taking Data			Percent Wilt	
	1938	1939	1938	1939
June	27	15	89	22
July	15	7	98	80
August	17	7	100	100

Very little wilt appeared in commercial corn plantings elsewhere in Nassau County until late August.

New Jersey

An accurate estimate of the relative prevalence of bacterial wilt in 1939 compared to former years could not be obtained in New Jersey because of the few highly wilt-susceptible varieties grown and the erratic regional distribution of the disease. Observations on several very susceptible varieties in test plantings indicate, however, that

conditions were in general more favorable for wilt infection in 1939 than in 1938. In certain local areas wilt was definitely more prevalent than in 1938 and in others it was about the same. Seneca 60 showed 90 percent and Gemcross 13 showed 38 percent wilt infection in a test field in Burlington County, which gave evidence that conditions were very favorable for the disease in Central New Jersey this year.

The factors which caused the erratic distribution of the wilt disease, frequently within a given field, are not well understood. In general the disease caused heavier losses in lower, moist than in dry, sandy areas. It was also observed that the population of the corn flea beetle varied with the incidence of wilt, the disease being more prevalent where the beetles were most abundant.

Pennsylvania

From H. W. Rankin a report has been received of an outbreak in sweet corn in Erie County, which is in the northwestern corner of Pennsylvania. From this it is apparent that the disease may well have been more serious in that region than in any year since 1933. In a series of variety tests, the most susceptible varieties showed in July, 12, 14, and 9 percent wilt, respectively. In 2 commercial plantings, where Dr. Rankin made counts on the same date, Early Golden Harvest showed 30 percent wilt and Northcross Hybrid showed 39 percent.

Ohio

The following report regarding wilt conditions in Ohio was received from Donald H. Bowman:

"Practically all of my observations concerning this disease have been made on dent corn during the latter part of the past growing season. However, it might be of interest to note the early occurrence of this disease here at Wooster on a few Wisconsin inbred lines of dent corn which were grown here for the first time this year. Wisconsin inbred 6 was about 99 percent killed by the time it reached the 3 to 4 leaf stage. Also, many plants of Wisconsin 26, 23, and 3 were killed by this disease, while many others were decidedly dwarfed.

"Rather extensive observations were made on single and double cross plantings in several localities in the State after the first week of August. Generally speaking, the disease was the most severe in the southern one-third of the State. The area in which the disease seemed to be the most severe included Ross, Highland, Fayette, Clinton, Greene, Montgomery, and Preble Counties. As one went north from this area the severity of the infection decreased until there was but very little in the northern one-fifth of the State. However, there was a small amount of infection in almost every field observed, especially if such a field was planted to a susceptible variety."

Roy C. Thomas supplements the foregoing report for Ohio with the following comment in a letter of February 5.

"The use of sweet corn hybrids has very definitely changed the situation regarding Stewart's disease in sweet corn in Ohio, in spite of the fact that it is more difficult than ever now to grow varieties which are extremely susceptible to the wilt. The carry-over of Aplanobacter stewarti in seed of hybrid field corn and in hibernating insects is enormous in all sections of the State, wherever corn is grown. Such a situation has forced the use of sweet corn hybrids. As a result we received last year very few specimens of sweet corn showing the wilt disease."

Indiana

Glen Smith reports that bacterial wilt was bad on early plantings of susceptible varieties as far north as Fort Wayne. By early June at Lafayette highly susceptible varieties were wiped out and there was an average loss on susceptible varieties of 50 to 60 percent. It was also bad on some pop corn varieties. By the middle of August the disease had ceased to be serious and stopped spreading. In general, conditions in Indiana were about as bad as in 1931.

Illinois

Benjamin Koehler reporter (PDR 33: 337) as follows:

"Bacterial wilt (Aplanobacter stewarti) caused more damage to early sweet corn and to some dent corn early in the season than occurred in 1938, and leaf infection spread to nearly all corn plants across the width of the State in central and south-central Illinois, but for the most part leaf infection in field corn did not kill as much leaf surface as in 1938, and of the 20 experimental fields examined significant damage to the leaves occurred only in the field located in Moultrie County."

The above reports indicate an incidence of bacterial wilt in sweet corn in 1939 agreeing very well with our forecast of April 1, 1939.--

> "There should be at least as much bacterial wilt on susceptible varieties of sweet corn as last year, with commercially significant losses as far north as Rockland County, New York, and Indianapolis, Indiana..... The accumulated effect of the past three warm winters may well result in losses more serious than those of 1937 or 1938."

THE LIMITATIONS OF THE FORECASTS

In view of the recognized importance of flea beetles in spreading this disease, it has seemed possible that more accurate local forecasts might be made from data on the abundance of flea beetles and the percentage of emerging beetles that carry the wilt organism. However, one season's work in Illinois, in cooperation with Dr. M. D. Farrar and Stanley W. Oexemann, has convinced one of us (Stevens) that the difficulty and uncertainty of securing such data may outweigh any probable advantage. We will then continue to experiment with forecasts based on the history of the disease and weather conditions.

We would, however, like again to point out the necessary limitations of these forecasts and note the significance of certain important changes in culture which must inevitably affect the whole disease situation, although by no means uniformly over the area being studied. It should be obvious that predictions based on general weather conditions, even if accurate, cannot be expected to be of more than general application. That is, they can at best no more than indicate the general areas within which the disease may be expected to be serious. Within these areas there will be numerous local fluctuations and exceptions of great importance to individual growers quite out of the range of any possible general forecast.

The changes in corn culture of importance in connection with the forecasts both relate to planting of hybrid corn, but seem to be very different in the different sections. In the eastern states where relatively little dent corn is grown, resistant hybrids, chiefly Golden Cross Bantam, now dominate the planting of sweet corn. While Golden Cross Bantam is by no means immune, and under some conditions shows commercially significant losses, it is in general so highly resistant that it does not suffer great losses. It may not even serve as a very satisfactory source of bacteria for the beetles. In general then, in the eastern States, there appears to be little chance of a real epidemic of the disease until planting practices change or a strain of the pathogen develops which is capable of doing serious damage to Golden Cross Bantam.

On the other hand, in States such as Ohio and Indiana, which grow sweet corn commercially, but in which the production of dent corn is a major industry, the situation has been greatly changed by the widespread planting during the last few years of dent corn hybrids, which were apparently very susceptible to bacterial wilt, with the inevitable result of a high carry-over of the pathogen. The importance of this in Ohio has recently been emphasized to the writers by such keen observers as F. D. Richey and R. O. Thomas. Apparently then, while we may reasonably expect fluctuations in the amount of disease in the corn belt during the next few years, there is every reason to believe that they will be at a somewhat higher level than hitherto.

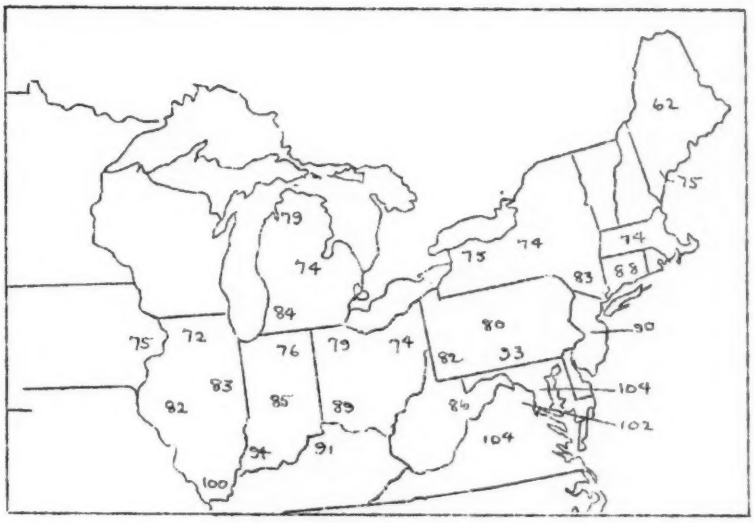

Fig. 1. Winter temperature indices for 1939-40.

TEMPERATURES OF THE PAST WINTER AND FORECAST FOR 1940

Temperature indices for the winter of 1939-40 at a number of stations are given in Figure 1. Indices for most of these stations have been published for a number of years. The trend of winter temperatures at Washington, D. C. and Indianapolis, Indiana 1930-31 to date is indicated by the curves in Figure 2.

In general over the area being studied, the winter just past was the coldest since 1936. North of Maryland and central New Jersey on the eastern seaboard and throughout the States of Ohio and Indiana, the winter temperature index was lower than has ever been known to be associated with heavy losses from bacterial wilt in sweet corn. As is well remembered by those who experienced it and is evident from Table 1,

Table 1. Mean monthly temperatures at Indianapolis for the last five winters.

	1935-36	1936-37	1937-38	1938-39	1939-40	Normal
December	25.9	35.8	29.5	34.3	36.1	33.2
January	22.2	33.2	29.4	35.9	16.8	28.4
February	21.8	30.4	37.7	33.2	32.2	31.1

January was by far the coldest month of the past winter in the Middle West. During much of this month there was considerable snow cover which may have protected both the pathogen and its insect carrier. We have no evidence as to this.

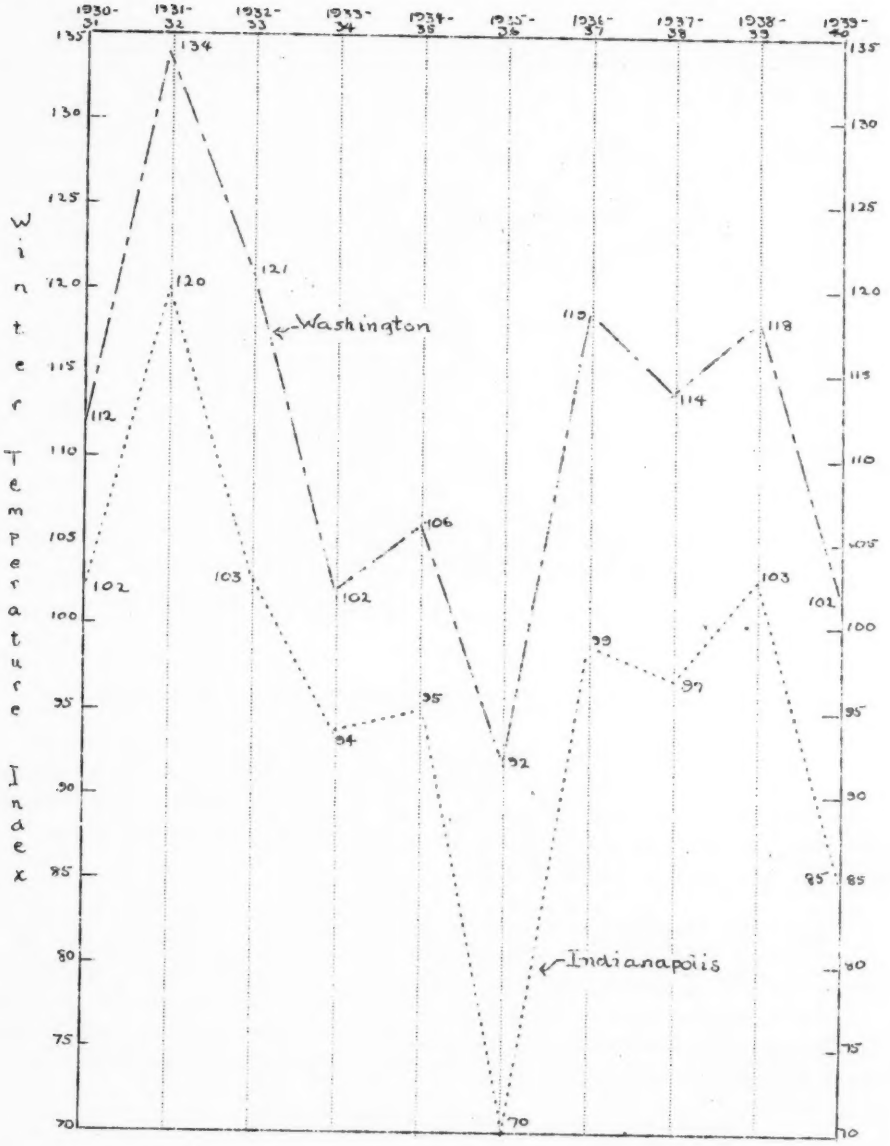

Fig. 2. Temperature indices of recent winters at Indianapolis, Indiana and Washington, D. C.

On the basis of available information it seems safe to predict that on the eastern seaboard, commercially significant losses will not occur north of Maryland and central New Jersey, with the possible exception of such a locality as Bellmore on Long Island where the disease seems to persist locally every year.

In Ohio and Indiana there seems to be no reason to expect commercially significant losses on sweet corn, unless as suggested by several correspondents, the prevalence of the disease in field corn results in a very high carry-over of the pathogen.

Whether the low temperatures of the past winter will be followed by a reduction in the incidence of this disease on field corn in central and southern Ohio and Indiana can be determined only by careful observations in the progress of the disease during the coming season. Surveys in this area should yield results of great interest in connection with this problem.

(University of Illinois and New Jersey Agricultural Experiment Station).

LEAF CRINKLE OF GERANIUM

P. P. Pirone

The first case in New Jersey of the virus disease of geranium, known as crinkle, was reported by the author in the May 15, 1938 issue of Plant Disease Reporter. This winter the disease has reappeared in a number of greenhouses where it is both prevalent and destructive. It may constitute a serious menace to the geranium industry unless growers take certain precautions to check its spread.

History

A number of European investigators have reported this disease at various times since 1908. Pape (Gartenwelt 31: 329-332. 1937) discussed the disease in considerable detail but apparently overlooked its exact cause. The first investigators to suspect that a virus was involved were Pethybridge and Smith (Gard. Chronicle 92: 378-399. 1932). Its occurrence in the United States was first reported by L. K. Jones (Phytopath. 28: 11. 1938). It is now known to occur in many of the larger floricultural centers of the United States and is widely prevalent in many European countries, especially England and Germany.

Symptoms

The first symptom is the appearance on the young leaves of round or angular yellow spots which vary from one-half to 2 mm. or more in diameter. Leaf growth ceases in the yellowed spots but continues in the surrounding green areas, causing the leaves to crinkle or pucker conspicuously. Usually the entire plant remains dwarfed, yellowed, and many leaves drop. Affected plants continue to make poor vegetative growth and eventually degenerate completely as is characteristic of most virus diseases.

The stems and roots of virus-infected plants always appear healthy. Therefore, growers should not confuse the different stem and cutting rot diseases commonly found on geraniums with crinkle.

Transmission

Pethybridge and Smith have shown that the virus is transmissible by grafting and cuttings, but found no evidence that it can be transmitted through seed. Jones found that the virus could be transmitted by grafting but was unable to produce infection by mechanical inoculation. Work conducted in New Jersey indicates that one of the most important means of dissemination is through infected cuttings.

Berkeley (Canadian Horticulture 61: No. 4, 108. 1938) working with the variety Helen Michell transmitted the disease from infected to healthy plants by means of grafting,--the incubation period lasting about 6 months. He states that circumstantial evidence indicated that white flies (Aleyrodidae) are involved in the transmission of the disease, and also suspected the geranium aphid (Macrosiphum pelargonii). These pests have also been observed on infected stock in New Jersey. In addition, a species of thrips was occasionally seen. However, to date, no work on insect vectors has been conducted in this State.

Observations in New Jersey

In 1938 more than 400 virus-infected geraniums consisting largely of the variety Olympic Red were found in one greenhouse. Apparently, the same disease was observed by the grower as early as 1933 on the variety Helen Michell, and later on Ricard.

The disease was not found in any of the several other large geranium establishments visited in 1938. An attempt to trace the source of the diseased stock at that time was unsuccessful, since the originators of the variety most severely affected had healthy stock plants in their greenhouses. Moreover, a recent visit to the same propagators revealed that their stock was still clean. Obviously, the infectious principle was not disseminated through the sale of infected stock in this case and was apparently transmitted from some less susceptible stock by an insect vector.

Observations on varietal susceptibility in 1938 showed that Improved Ricard and Poitevine appeared to be less susceptible than Olympic Red, whereas the white varieties seemed to be immune.

Additional observations made in other establishments in 1940 revealed that Olympic Red and Salmon Supreme were most susceptible. A small percentage of infected plants was noted on the variety Ricard, whereas Poitevine, Appleblossom, and White Buchner were clean. The grower was of the opinion that the disease was introduced on Salmon Supreme purchased the previous year. This variety was planted adjacent to Olympic Red and the disease soon appeared conspicuously on the Olympic Red immediately bordering Salmon Supreme. Thrips were abundant on snapdragons growing in a nearby bench and were suspected of transmitting the virus.

In another greenhouse visited in 1940 the 2 most severely infected varieties were also Olympic Red and Salmon Supreme. One-third of these plants had to be discarded by the first of February. The varieties Ricard and Poitevine appeared to be much less susceptible, although an occasional infected plant was found.

Control

Growers should inspect newly purchased stock plants carefully before using them for propagating purposes. If possible, stock plants should be kept from houses where young plants are growing for the first year. Suspicious plants should be rogued out from time to time and the cuttings taken only from those plants which were normal in color and growth during the preceding year.

The disease is transmitted from season to season through the use of infected cuttings. It is doubtlessly transmitted during the growing season from plant to plant and from variety to variety by means of some insect. For this reason growers should attempt to keep all insects in a geranium house down to a minimum by the use of the proper insecticide.

However, the most serious problem involved in attempting to control crinkle is the difficulty of recognizing the disease during certain periods. Earlier investigators have pointed out (and this has been observed repeatedly in New Jersey) that the symptoms either disappear or are masked during the summer months. Although symptoms are most striking during February, March, and April, many affected plants apparently outgrow the trouble, their normal color reappearing. Growers hesitate to discard such plants on the assumption that they have recovered. Cuttings taken from masked plants in early winter appear normal and do not show the typical symptoms until these plants are 6 to 8 weeks old. An entire crop may be completely destroyed within a few years if diseased stock plants are used for propagation.

(From New Jersey Agricultural Experiment Station, Department of Plant Pathology, Nursery Disease Notes 12: 35-38. March, 1940).

NOTES ON THE LIST OF VIRUS DISEASES OF STONE FRUITS

K. Starr Chester

Dr. W. D. Valleau has made some corrections and additions to my description of his plum mosaic in the Plant Disease Reporter of March 1, 1940, page 76. They are as follows:

Fruit symptoms ...	"Normal but rare on trees in chronic stage."
Leaf symptoms	"Showing a variety of pale ring and line patterns or yellowish oak-leaf design on vigorously growing trees. Small, narrow, and chlorotic on trees in chronic stage."
Range	"Kentucky; Ohio."
Comments	"Occurs as a nursery disease. Also attacks peaches if budded with affected plum."

Dr. Lee Hutchins comments on the statement on page 75 under "Phony Peach" referring to the possible relationship of this virus to peach yellows, as follows:

> "Phony peach and peach yellows overlap in their territorial distribution in Tennessee. The symptoms of phony disease remain as described in the literature, and the symptoms of yellows undergo no change. It would appear that in this borderland for the two diseases, if they were actually caused by the same virus, there should be a discernible intermediate ground in symptom manifestation. Several years ago near Cornelia, Georgia, an outbreak of typical peach yellows occurred. This would be somewhat difficult to account for if peach yellows and phony disease are caused by the same pathogen, since phony disease occurs in that general district."

(Oklahoma Agricultural and Mechanical College).

OCCURRENCE OF CURLY TOP IN THE PACIFIC NORTHWEST IN 1939

B. F. Dana

Losses from curly top on vegetables were much less in 1939 than in 1938 for both Oregon and Washington. General observation indicates that the disease was more restricted in its occurrence and reduced in its severity than for the previous two years.

West of the mountains in the Puget Sound area and in the Willamette Valley only traces of the disease were noted on tomato and no occurrence on other hosts.

East of the Cascades in Washington observations were made September 29 in the Yakima Valley. Losses for tomatoes seeded directly in the field ranged from 5 to 15 percent with the average estimated at about 10 percent. Losses for experimental plots where tomatoes were transplanted ran as high as 75 percent. The incidence of curly top in some fields of sugar beets was higher than for tomatoes, due probably to the earlier planting of the beets.

On the Oregon side of the Columbia River losses in the Dalles section ranged from 10 to 15 percent with some fields showing 30 percent disease. In the Hermiston-Stanfield-Irrigon section many tomato growers raised fair crops on unprotected plants. Losses were estimated at about 50 percent.

Losses from curly top in peppers, cantaloups, cucumbers, squashes, and pumpkins were very much less than for tomato. No detailed figures were taken for these crops.

(Division of Fruit and Vegetable Crops and Diseases, U. S. Bureau of Plant Industry).

SOME ISOLATIONS OF VERTICILLIUM IN ILLINOIS DURING 1938 AND 1939

J. C. Carter

In Illinois Verticillium albo-atrum Reinke & Berth. was cultured from diseased tissues of 6 species of plants in 1938 and of 5 species of plants in 1939. The hosts and their locations are recorded in Table 1. The culturing of V. albo-atrum from yellow-wood (Cladrastis lutea Koch) in 1938 and linden (Tilia glabra Vent.) in 1939 constitutes the first record of this fungus on each of these 2 hosts in Illinois.

Table 1. Host plants of Verticillium albo-atrum Reinke & Berth. and their distribution in Illinois in 1938 and 1939.

Host	Location		No. plants infected	
	County	Town	1938	1939
Acer platanoides L. (Norway maple)	Champaign	Urbana	1	1
	Cook	Addison	1	
		Brookfield	2	
		Chicago		1
	LaSalle	LaSalle		1
Acer saccharum Marsh. (Hard maple)	Champaign	Champaign	1	
	DuPage	Hinsdale		1
Catalpa speciosa Warder (Western catalpa)	DuPage	Wheaton	1	
Cladrastis lutea Koch (Yellow-wood)	Bureau	Princeton	1	
Paeonia sp. (Peony)	DuPage	Downers Grove		1
Rhus glabra L. (Smooth Sumac)	DuPage	Hinsdale	2	
Tilia glabra Vent. (American linden)	Champaign	Urbana		1
Ulmus americana L. (American elm)	Champaign	Champaign		1
		Urbana	2	
	Cook	Chicago	3	
		DesPlaines		1
		Hines		2
		Homewood		1
	DuPage	Hinsdale	1	2
	LaSalle	LaSalle		2
		Peru	1	
	Peoria	Peoria		1
	Vermilion	Danville	1	
	Winnebago	Rockford	1	
(Littleford elm)	DuPage	Hinsdale		4
(Moline elm)	Champaign	Urbana		1
	Cook	Addison		1
		DesPlaines		1

(Section of Applied Botany and Plant Pathology, Illinois State Natural History Survey).

A LEAF-SPOT DISEASE OF NANDINA

John A. Stevenson

Several years ago specimens of a Cercospora on Nandina domestica, an exotic ornamental shrub of the Berberidaceae, were received from that veteran collector and student of the fungi, Dr. Geo. W. Carver. Doctor Carver noted that the fungus involved was doing "quite a bit of damage to the foliage" of plants growing in the area in Alabama where his collections were made.

No records of Cercospora on Nandina were found at the time and Dr. Charles Chupp was of the opinion that a new species was involved. Later, however, there came to our attention the paper by Nagatomo 1/ in which he described Cercospora nandinae as a new species causing a so-called red-spot disease of the leaves of Nandina domestica in Japan.

The Alabama specimens agree both in the symptoms noted on the leaves and in the morphology of the fungus involved with Nagatomo's description. The diseased areas are amphigenous, irregular, without definite margins, and often involve most of the leaf blades. The spots are at first reddish brown becoming dark brown. Defoliation often results.

The fungus is hypophyllous in its fruiting, showing on fresh material as gray patches, but is unfortunately evanescent and so for the most part is quickly rubbed off of herbarium specimens, making a study of it from such material rather trying. Conidiophores and conidia are typical of the genus, however, the former light olivaceous, sparingly septate, 15-50 x 3-5 mu.; the latter concolorous, obclavate, indistinctly septate, 25-75 x 2-4 mu.

(Division of Mycology and Disease Survey, U. S. Bureau of Plant Industry).

BRIEF NOTES ON PLANT DISEASES

USTILAGO VAILLANTII ON BELLEVALIA: In November 1939, 4 bulbs of Bellevalia sp. (probably B. romana) were sent to the writer from Pittsburgh, Pennsylvania for identification. The sender stated that the bulbs were bought in an Italian store, so in all probability they were imported from Italy. These were planted in a garden and grew well. When they bloomed in March it was noted that all the flowers of one plant

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1/ Nagatomo, I. Notes on two diseases of ornamental plants caused by Cercospora. Forschungen auf dem Gebiet der Pflanzenkrankheiten Univ. Kyoto 3: 109-111, figs. 1-2. 1937.

were smutted. The symptoms fitted the description of Ustilago vaillantii Tul. This smut has been reported on Bellevalia and other hosts from Europe, but, as far as the writer knows, it has never been reported on this host in this country, although it has been reported on Muscari comosa from Massachusetts. (A. G. Plakidas, Louisiana Agricultural Experiment Station).

NOTES ON THE STINKING SMUTS OF WHEAT FROM AFGHANISTAN IN 1939: Fifty-three small samples of wheat from Afghanistan were examined recently by the writer at the Bureau of Entomology and Plant Quarantine Inspection House. Of these, 19 samples were found to include smut balls of bunt. Microscopic examination showed the distribution to be 18 samples infected with Tilletia levis Kühn, and only 1 sample with Tilletia tritici (Bjerk.) Wint. The samples were collected in 11 different localities. In no single collection did both species appear. This may have been a matter of chance, however, as the samples were small, several weighing no more than one-half ounce and the others up to one pound. The distribution of the 2 species is very similar to that found in samples of wheat from Turkey as reported in the Reporter (21: 31, February 1, 1937). In both countries T. levis would appear to be the predominant species.

In addition to the smut 3 of the 53 samples carried galls of the wheat nematode, Anguina tritici (Steinbuch) Filipjev. (Donald P. Limber, U. S. Bureau of Entomology and Plant Quarantine).

BACTERIAL RING ROT OF POTATO IN NORTH DAKOTA: "In North Dakota the first case of potato ring rot was found and definitely identified in White Rose potatoes from the 1938 crop. It is possible that traces of the disease had occurred in a few scattered fields before 1938 without being observed. However, no tubers with definite symptoms of the disease had been received in the Pathology Laboratory before 1938. The disease attracted serious attention by growers and buyers in 1939 and already some producers have had serious losses." (W. E. Brentzel, Bacterial ring rot, a new potato disease. North Dakota Agricultural Experiment Station, Bimonth. Bull. 2: 12-14. Jan., 1940).

VIEWPOINTS

"Insects and fungi are not the real cause of plant diseases, and only attack unsuitable varieties or crops improperly grown. Their true role in agriculture is that of censors for pointing out the crops which are imperfectly nourished. Disease resistance seems to be the natural reward of healthy and well-nourished protoplasm. The first step is to make the soil live by seeing that the supply of humus is maintained.

"The policy of protecting crops from pests by means of sprays, powders and so forth is thoroughly unscientific and radically unsound; even when successful, this procedure merely preserves material hardly worth saving. The annihilation or avoidance of a pest involves the destruction of the real problem; such methods constitute no scientific solution of the trouble but are mere evasions.

"The protection of an area from imported pests is fortunately almost impossible to carry out in practice on account of the rapid improvement of communications and the increasing volume of traffic. If the present regulations were really effective, they would be harmful in that we should be deprived of a portion of the censors which Nature has provided for keeping our agriculture up to the mark."--Sir Albert Howard, "The Role of Insects and Fungi in Agriculture," Empire Cotton Growing Review 13: 186-192. 1936.